Abstract

The positioning of wireless nodes in indoor Wireless Local Area Network (WLAN) using Received Signal Strength Indication (RSSI) has become an attractive low cost localization solution. The location accuracy of RSSI based algorithms is dependent on node placement topology. The localization performance analysis reported for nodes arranged in V-shaped linear configuration. The uniqueness of this work ensures comparative study of localization performance in V-boundary array and its counterpart regular rectangular boundary node layout. The localization performance is computed in terms of Cramer - Rao Lower Bound (CRLB) of range estimate under dynamic indoor environments. The test bed experiment and simulation results demonstrate that the localization improves for lower included angle of the V-shaped array geometry and for higher aspect ratio of rectangular geometry. Interesting result of our analysis is that for V-shaped linear array with included angle of 22.5° has better localization performance compared to its corresponding rectangular shaped node configuration.
Wireless Node Localization for V-shaped and Rectangular-shaped Node Deployment Schemes


Index Terms

Computer Science

Wireless Networks

Keywords

Localization  CRLB  RSSI  V-boundary array